

CLAIMS:

1. An emission abatement device comprising:
  - first and second conduits secured to one another at upstream and downstream openings, the first conduit comprising an intermediate portion extending from the upstream opening to the downstream opening,
  - a 3-way catalyst positioned in the first conduit downstream from the downstream opening,
  - a hydrocarbon trap positioned in the second conduit, and
  - a valve positioned in the intermediate portion, the valve being movable between (i) a closed position to block passage of exhaust gas through the intermediate portion to force the exhaust gas into the second conduit for passage through the hydrocarbon trap to the 3-way catalyst, and (ii) an opened position to allow passage of exhaust gas through the intermediate portion and the hydrocarbon trap to the 3-way catalyst.
- 15 2. The emission abatement device of claim 1, wherein the first conduit comprises (i) a first upstream tube secured to the second conduit at the upstream opening, (ii) a first downstream tube secured to the second conduit at the downstream opening, (iii) a valve housing containing the valve and extending between the first upstream tube and the first downstream tube, and (iv) a catalyst housing containing the 3-way catalyst and secured to the first downstream tube.
- 20 3. The emission abatement device of claim 2, wherein the second conduit comprises (i) a trap housing containing the hydrocarbon trap, (ii) a second upstream tube secured to the first upstream tube and the trap housing, and (iii) a second downstream tube secured to the trap housing and the first downstream tube.

4. The emission abatement device of claim 1, wherein the second conduit comprises (i) a trap housing containing the hydrocarbon trap, (ii) an upstream tube secured to the trap housing and to the first conduit at the upstream opening, and (iii) a downstream tube secured to the trap housing and to the first conduit at the 5 downstream opening.

5. The emission abatement device of claim 1, further comprising a controller operable to position the valve in the closed position for a predetermined period of time.

6. The emission abatement device of claim 1, further comprising a 10 controller operable to move the valve from the closed position to the opened position upon expiration of a predetermined period of time.

7. The emission abatement device of claim 1, wherein the valve is a butterfly valve.

8. An emission abatement device comprising:  
15 a housing,  
a tube positioned in the housing to define an outer passageway therebetween,  
a hydrocarbon trap positioned in the outer passageway,  
a 3-way catalyst positioned downstream from the hydrocarbon trap,  
20 and

a valve movable between (i) a closed position to block passage of exhaust gas through the tube to force the exhaust gas into the outer passageway to pass through the hydrocarbon trap to the 3-way catalyst and (ii) an opened position to allow passage of exhaust gas to the 3-way catalyst through the outer passageway and 25 the hydrocarbon trap and through the tube.

9. The emission abatement device of claim 8, wherein the 3-way catalyst is positioned in the housing, the housing defines a chamber positioned between the hydrocarbon trap and the 3-way catalyst, the housing and the tube define an outer outlet opening to discharge exhaust gas from the outer passageway into the 5 chamber for passage to the 3-way catalyst, and the tube defines an inner outlet opening to discharge exhaust gas from the tube into the chamber for passage to the 3-way catalyst.

10. The emission abatement device of claim 8, wherein the housing and the tube define an outer outlet opening to discharge exhaust gas from the outer 10 passageway, and the tube defines an inner outlet opening to discharge exhaust gas from the inner passageway.

11. The emission abatement device of claim 8, comprising a controller operable to position the valve in the closed position for a predetermined period of time.

15 12. The emission abatement device of claim 8, comprising a controller operable to move the valve from the closed position to the opened position upon expiration of a predetermined period of time.